

July 15, 1961

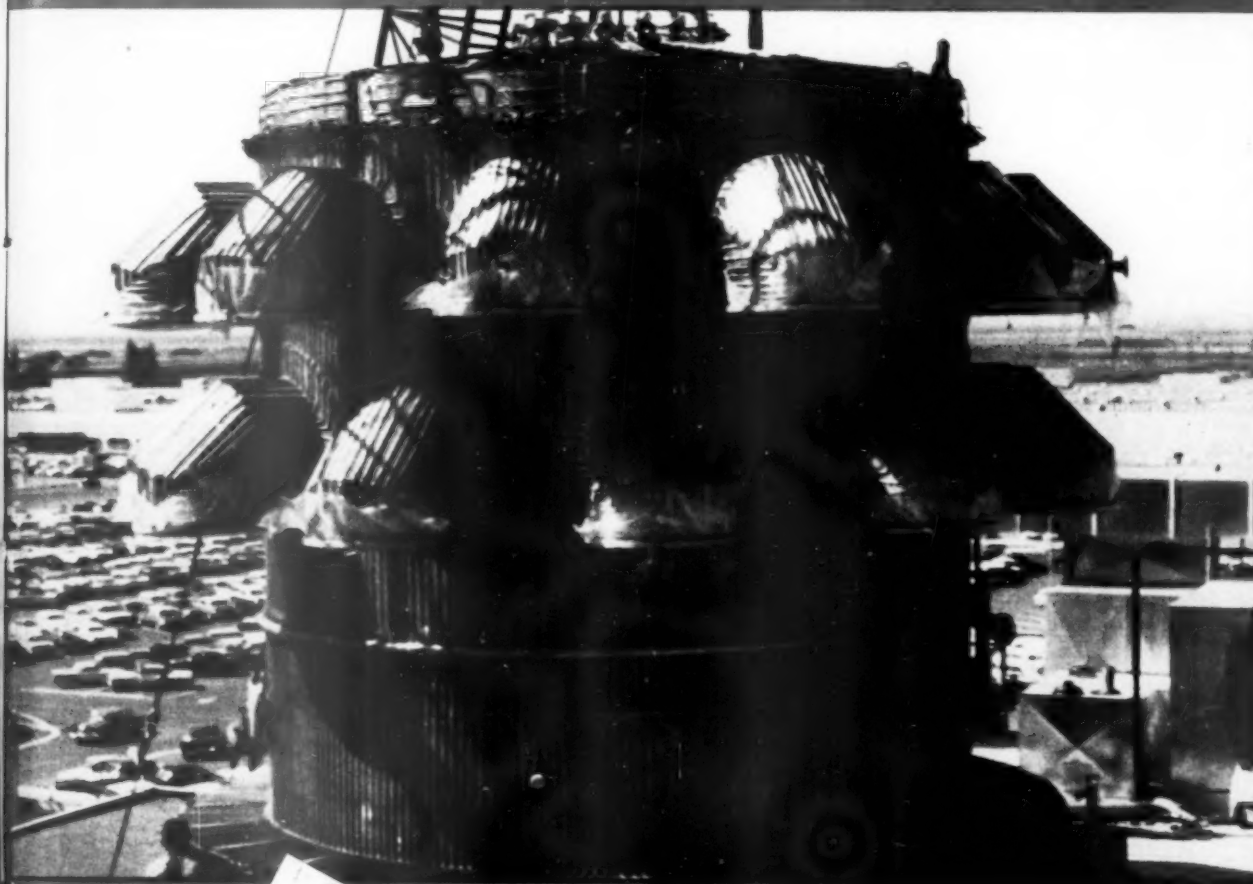
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THE WEEKLY SUMMARY OF CURRENT SCIENCE



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ORNITHOLOGY

Albatross "Beats the Heat"

► **STUDIES** of "how to beat the heat" have been aided by the albatross, the good luck symbol of ancient mariners and the "gooney bird" of the Pacific.

Drs. Thomas R. Howell and George A. Bartholomew, University of California, Los Angeles, zoologists, have made a special study of the big birds on Midway Island in the Pacific. These albatrosses are extremely tame and make good scientific subjects, they report.

The UCLA scientists have investigated how albatrosses and their young survive the extreme temperatures of their desert island sanctuaries. They have found that the birds lay their eggs (one to a nest), hatch them and rear the infant birds during Midway's mild season before the intense summer heat sets in.

The young albatrosses are equipped with a number of mechanisms for adapting to heat as the summer approaches. One such mechanism is in the webbing of their feet.

This relatively thin membrane contains a large number of tiny blood vessels from which heat in the blood can be dissipated.

The birds sit on their heels with their webbed toes in the air (to keep the webbing off the hot sand) and shade their feet with their bodies to make the most effective use of this heat-dissipating mechanism.

The young get their water from squid fed to them by their parents. The water from the squid is quite salty, but the birds have an unusual mechanism in their nostrils for excreting salt. Adequate water is thus made available for evaporative cooling of the body.

The adult birds drink sea water most of the time. They have been observed to peck at raindrops while nesting. They may obtain some water in this manner while brooding since they refuse to leave the nest for the sea during this period.

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TECHNOLOGY

Aid New Nations' Needs

► **COMPETENCE SHOWN** by the United States in developing new technologies for space conquest should be applied to helping the world's underdeveloped areas as well.

But each step in a development program should be geared specifically to actual conditions and needs of developing economies now emerging from traditional societies. In early stages, "power dams and steel mills" place too large a burden on low-level economic conditions and limited skills.

This approach to U.S. assistance for young nations comes from Jack Baranson, research associate with the Committee for Economic Development in Washington, D.C. He suggests how several technological innovations might be "tailored to national levels and aspirations."

New products, such as high-protein flours made from fish, could help solve critical food supply problems.

New industrial processes could give developing economies "competitive advantage in selective markets"—for example, producing reinforced plastic to replace steel as a structural material.

Many developing areas, Mr. Baranson points out, are just as cut off from "civilization" as orbiting satellites. They need self-sustaining, long-life products and equipment. New systems and designs also would foster local pride and prestige—"no small factor in emerging nationalism."

Technicians responsible for solar batteries in space satellites might apply their ingenuity to developing low-kilowatt generators for small-scale industries in remote villages. A thermoelectric coupling could be used, for example, to convert heat from kerosene lamps into electricity.

Low-cost nylon bearings, requiring no

lubrication, could be installed on ox carts and other simple vehicles.

Communications satellite systems offer possibilities for educating "vast numbers of illiterates in remote regions." World-wide TV channels could furnish developing areas with latest medical techniques or agricultural and industrial extension services.

Mr. Baranson suggests allowing private firms to bid on research contracts "just as aerospace firms do for the National Aeronautics and Space Administration." In time, some firms would be familiar enough with situations in particular countries to specialize in their technological development. And the funds provided to create new technologies would greatly increase the individual country's own ability to produce needed food and materials.

Each country's "deep-rooted cultural and psychological affinities" should be considered, he said. National tastes may overshadow economic necessity. In certain Asian countries, for example, people were so accustomed to eating rice that it was necessary "to simulate the taste, texture, and even the shape of rice grains" in order to make wheat flour acceptable.

As used in existing foreign aid programs, advanced technologies have only made the gap separating have and have-not nations more obvious, rather than narrowing it, Mr. Baranson believes.

A revised program "compatible with the interests and yearnings of new nations" would provide bold, imaginative help for emerging nations in Africa, Asia and Latin America, he said.

A preliminary statement on Mr. Baranson's report appears in the Harvard Business Review (July-Aug.).

• Science News Letter, 80:34 July 15, 1961

METALLURGY

Supersonic Wet "Bullets" Fired Into Thick Metals

► **RESEARCHERS** are firing "bullets" of water into metal targets at supersonic speeds to study the erosive action of water droplets, an American Society of Testing Materials symposium learned in Atlantic City, N. J.

Water jets, traveling at velocities up to 3,400 miles an hour are released when a lead pellet is fired by compressed air into a small sealed reservoir. The jet then strikes the test metal. It can leave a sizable dent in thick slabs of copper and stainless steel.

S. M. DeCorso and R. E. Kothmann of the Westinghouse Electric Corporation's research laboratories, Pittsburgh, Pa., said the tests are aimed at finding ways to prevent erosion in turbine blades from water drops in moist steam. Similar erosion affects air-plane and missile surfaces when they hit raindrops during high-speed flights.

Stellite (a cobalt alloy) and tungsten carbide have shown the greatest resistance to water bombardment in metals tested to date, they reported.

A side effect of their scientific shooting expedition has yet to be explained. Photographs show that a burst of light, lasting less than one-millionth of a second, is given off by the water as it crashes into metal. No one knows why.

• Science News Letter, 80:34 July 15, 1961



POWER FROM SUN—The Somor concentrator, adapted for solar cells in satellites, is expected to increase the amount of electricity from sunlight by 45%. Researchers of the Boeing Company, Seattle, Wash., produced intensity of more than 100 watts a square foot in studies made on the haze-free slopes of Mt. Rainier, Washington.

SPACE

A-Powered Satellite

The first nuclear-powered satellite, Transit IV-A, can be pinpointed at all times and will provide more information about the earth's gravitational field, Tove Neville reports.

► THE NEW TRANSIT IV-A satellite is the first navigation satellite up high enough for scientists to figure out exactly where it is and will be at all times.

Transit IV-A, which is the first nuclear-powered, three-in-one satellite package, is now circling the earth at 550 miles at the closest point and 629 miles when farthest away.

The position of Transit IV-A is much easier to calculate than that of earlier Transit satellites because there is no air drag at this high altitude. Transit will also supply more information about the earth's gravitational field. (Gravity is the pull on all objects towards the earth's center.)

The rocket was launched at a 66-degree angle from the equator, so that the Transit can be used twice a day from most of the earth's surface to determine position. The satellite takes 104 minutes for the trip around the globe.

The future Transit system will consist of four satellites enabling ships and aircraft to find their position anywhere on earth every half hour. They are expected to have

nuclear batteries. Transits will also be important for defense since submarines carrying Polaris missiles can use the Transit to find their position for purposes of shooting missiles to target.

Transit IV-A is powered by a nuclear battery containing the radioisotope plutonium-238, expected to last many years. Greb III and Injun were launched with the Transit. The two companion satellites are designed to collect information for studying radiation effects, necessary for planning manned space travel.

The operational Transit system satellites are scheduled to go up sometime in 1962 after two or more test shots. The Transits sent up so far are experimental, designed to test the memory device that receives information from earth and sends it back when needed, to test time signals, and to improve techniques for calculating the orbits of satellites. Nuclear batteries are being tested because chemical batteries would not have a long enough "life."

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THREE-IN-ONE—Transit IV-A and two companion satellites are being installed in the nose cone of the launch rocket, a Thor-Able-Star, at Cape Canaveral, Fla. Transit IV-A (bottom) is a forerunner for operational navigation satellites. The space probe Injun (center) was designed to study radiation of the Van Allen belts and aurora borealis, or Northern Lights. The sphere (top) is the Greb-III satellite that is measuring solar radiation.

ANTHROPOLOGY

Space Men Predicted

► NOW THAT MAN has been put briefly into space and scientists are seriously planning to send men to the moon or nearby planets, anthropologists are speculating on what the first visitor to earth from space may be like.

Not much stock is placed in the comic books' picture of the visitor from space. It is of "little help," says Dr. William Howells, professor of anthropology at Harvard University. The comic books show only flying saucers manned by "flabby little web-footed goblins with knobs on their heads."

Dr. Howells has built up a scientific picture of the first men from space, based on the course of human evolution.

"I will lay a small bet," he said in *Discovery*, 22:237, 1961, "that the first men from Outer Space will be neither bipeds nor quadrupeds, but bimanous, quadrupedal hexapods" (two hands, four feet, six limbs).

Look for the space visitor to have one head and two sexes, Dr. Howells recommends.

"Two heads are not better than one; making up a single mind is more than most of us can do, as it is."

Look for plenty of fingers on the ends of two arms.

"Two arms; not three, because the creatures should be symmetrical like us; and

not four, because coordination would probably be too difficult for efficiency. Centipeds have to run their arms in teams."

"Five fingers seems like a good number, perhaps a minimum."

Perhaps, if our space visitor does have two hands with five fingers, we may expect that he will have developed a decimal system of numbers as we have.

We can surely expect hands and fingers on any intelligent being from space.

"If we can learn anything from our evolution," Dr. Howells explains, "it is that we had to be able to do things to become human. And our whole struggle was the getting and freeing of hands to do them with. Surely, we would not have had large brains without them."

After speculating what the intelligent being created by evolution on a distant world would have to be like, Dr. Howells wonders whether the chain of evolution that produced man could ever be repeated.

"Supposing, in a moment of idiot progress, we really killed ourselves off. Would *Homo* rise again?"

The ancient ancestors of man are all gone, "man has competed them into the grave."

There are still the apes, but they are probably too specialized to turn to freer use of the hands. Monkeys might do if

something made it worth while for the species to stand up. In this case, the new men might have tails. But, in fact, the monkeys have made no move to mimic human ancestors during about 35,000,000 years.

No other higher mammals of this earth will serve to start man's evolutionary line.

"Horses, dogs, elephants, all are deeply committed to being what they are." The next try, Dr. Howells concludes, would have to come from a tree shrew, laboriously repeating all of primate history. But, before the little tree shrew could start the evolutionary line now, the world would have to be swept clean of the kind of competition which might overwhelm the shrew's descendants. This means getting rid of most higher mammals, above all rats, cats, and monkeys.

"All in all, our hopes for repetition are not good, and we had better stay the hand that drops the bomb."

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MEDICINE

Arthritis Heredity Link

► A LINK BETWEEN inherited factors and chronic arthritis in women has been found by University of Manchester scientists.

Osteoarthritis, or degenerative arthritis, is regarded by physicians as essentially a nuisance, rather than a crippling disease. Unlike inflammatory diseases such as rheumatoid arthritis, which attacks the relatively youthful, osteoarthritis usually afflicts the elderly.

A survey of 206 women and 173 men of ages 55 to 64 in Leigh, a town in Lancashire, England, showed that a high percentage of women with multiple-joint osteoarthritis also had an arthritic condition called Heberden's nodes. This condition is believed to be inherited through a gene dominant in females and recessive in males.

Heberden's nodes are bony outgrowths in the joints of the fingers. It now appears that this relatively mild form of ailment is likely to lead, in women patients, to a generalized, or polyarticular, form of osteoarthritis—that is, one affecting many joints, rather than a localized form confined to only a few joints.

Among the women checked at Leigh, about 70% of those with osteoarthritis in six or more groups of joints also had Heberden's nodes. About 40% of those with the generalized disease in three to five groups

of joints likewise had the finger-joint nodes.

Hereditary factors may activate osteoarthritis in men, too. But injuries, occupational stress and mechanical factors are believed to play a bigger part. An earlier study, for example, showed by X-rays that miners in Leigh were subject to the disease to a far greater extent than other men whose work involved less physical strain. The knees and back were particularly affected.

Surprisingly, the miner's own verbal accounts of their back and limb aches ("complaint rate") differed very little from those of the other men. Complaints, the researchers concluded, are not the best gauge of actual disease incidence.

Reporting in the *British Medical Journal*, July 1, 1961, Dr. J. H. Kellgren, director of the University's Rheumatism Research Center, states more research work on the disease is "urgently needed." Although future prospects are promising, "the eradication of osteoarthritis is still an ideal goal for the remote future," he states.

Dr. Kellgren believes work on osteoarthritis may have been neglected because it is "one of those dull commonplace disorders that are hard to study with enthusiasm."

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MEDICINE

Child Autopsy Urged

► SOME CHILDHOOD DEATHS officially blamed on accidents probably are undetected murders, a Cleveland pathologist reports.

"It is relatively simple to destroy the life of a child in almost absolute secrecy without the necessity of taking any elaborate precautions," states Dr. Lester Adelson, chief deputy coroner for Cuyahoga County and assistant professor of forensic pathology at Western Reserve University School of Medicine.

The way to make sure justice is done, he says, is "the time-honored combination of complete autopsy and thorough police investigation." He believes an autopsy should be performed on any child whose death arouses even the slightest suspicion—not only to establish guilt, but innocence as well.

Dr. Adelson bases his opinion on a study of 46 cases of pedicide—child murder—that occurred in or near his home county during a 17-year period.

Several of the victims, hospitalized hours or even days before death, were too young to communicate with investigating officers. In some cases, attending physicians made faulty diagnoses. Death by violence was diagnosed only after a coroner's autopsy disclosed internal injuries in children said to have been "found dead in their cribs."

The nature, degree and age of the injuries often proved that the responsible adults were lying when they offered such explan-

ations as accidental falls from cribs and accidental dropping during bathing.

In some cases, verdicts of accidental death were pending when witnesses appeared to tell what had really happened, changing the picture to one of murder.

The 46 child killings represented about three percent of all known homicides in the area during the time covered. Thirty-six were killed either by parents or foster parents. One was "fatally assaulted by a psychotic paternal grandfather." Eight were slain by non-related persons such as neighbors and strangers, including five connected with sex crimes.

Of the 41 murderers responsible for the 46 child deaths, one was never identified, 17 were "patently mentally ill" and four were "borderline psychotic" but judged legally sane.

Some types of violence were utilized that "would rarely if ever be successful with a vigorous adult, able to offer effective resistance." These included starvation, drowning, smothering with a sheet or pillow, carbon monoxide asphyxiation with automobile exhausts and some types of beatings and kickings. Several infants died from injuries suffered "when they were violently squeezed by an irate father."

Dr. Adelson's report on "slaughter of the innocents" appears in the *New England Journal of Medicine*, 264:1345, 1961.

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EDUCATION

NSF Announces Grants For School Equipment

► THE NATIONAL Science Foundation has announced 56 grants totaling \$716,400 to enable mathematicians, scientists and engineers to develop equipment that will help update classroom instruction in specific fields such as physics and engineering. The grants go to schools and colleges in 23 states.

Users are expected to supply teachers with full information on any apparatus devised, and to permit interested commercial firms to negotiate for production and marketing.

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GENERAL SCIENCE

Metric System Proposed

► UNITED STATES housewives in the future will go to the grocery store and buy a liter of milk instead of a quart and a kilogram of meat instead of a pound, if Congress passes legislation adopting the metric system.

How a change from the present centuries-old system of weights and measures to the metric system would affect life in the U.S. is the subject on which House hearings began June 28.

The 12-inch ruler, the yardstick and the pound scale would become as outdated as the horse and buggy if the metric system were adopted. Some opposition is expected due to the natural resistance to change.

Nearly all U.S. research and scientific organizations have been using the metric system for years and strongly recommend it to avoid the "double standard" of weights and measures. The National Bureau of Standards has taken a "middle-of-the-road" policy in the discussion, waiting for Congressional action, if any, on the proposed conversion.

"Perhaps the greatest resistance to the proposed change would come from manufacturers and other commercial businesses," a National Bureau of Standards scientist said. Engineers use thousandths of an inch in calibrating industrial tools and land is measured in standard feet and acres, the scientist noted.

The U.S. system of weights and measures is currently used in most English-speaking countries. It was first introduced in England in the 13th century by King Edward I of England who thought a new measurement was needed to replace the arm or foot length as a measurement.

The metric system was developed toward the end of the 18th century and was adopted by the French Government in 1793. It was based on the meter, which was then one ten-millionth of an imaginary straight line drawn on the earth's surface from the North Pole through Paris to the equator. Today the meter is based on one wavelength of light of krypton, an inert gas.

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PUBLIC SAFETY

Simplify Survival Care

► TRAINING IN SURVIVAL CARE needs to be modified "from a nice-to-know basis to a need-to-know requirement," with theory and refinements thrown out the window, the National Conference on Disaster Medical Care was told in New York.

Col. Don S. Wenger of the U.S. Air Force surgeon general's office said present first aid training is too complicated and "seems to have fallen way short of the mark" when applied to actual disaster conditions. He said mass casualties from a nuclear attack would have to be treated by laymen, since few physicians will be available, functional or in the right place.

Col. Wenger therefore believes everyone should be taught "four essential items":

First: Stop bleeding. A bandage over a bleeding wound usually is all that is necessary. Tourniquets are rarely needed. Since it may be hours or days before the patient reaches a physician, "the use of a tourniquet (under mass casualty conditions) means the loss of a limb."

Second: Maintain effective respiration. Close sucking chest wounds "just like you would plug a hole in a leaking boat." Maintain airways by pulling out a tongue or a slipping denture. Keep patients from "drowning themselves in blood or secretions by positioning the wounded man so these fluids cannot accumulate in the air passages."

Third: Splint a broken bone where the patient lies, without moving it. Try to make it look like the other uninjured side, and splint it so it cannot wiggle. Instruction that goes much beyond this "goes beyond the layman's ability to understand, and also, in times of stress, to remember."

Fourth: Handle injured people properly. "Please note I said people, not injuries. A word of reassurance, positioning for comfort, and careful movement of an injured patient may well make the difference between inviting or preventing shock," Col. Wenger said.

Col. Wenger said most first aid courses put undue stress on shock—a subject that the medical profession itself does not completely understand.

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METEOROLOGY

Nuclear Battery Powers Weather Transmitter

► A NEW WEATHER transmitter powered by a nuclear battery will send weather information from the North Pole for the next ten years.

Dr. Glenn T. Seaborg, Atomic Energy Commission chairman, pushed a button in Washington, D. C., and received weather information from the station, now located at the Martin Company, near Baltimore.

The battery powering the transmitter is similar to the one inside the earth-circling Transit IV-A satellite. In the navigation satellite, the battery's power is used for sending radio signals back to earth.

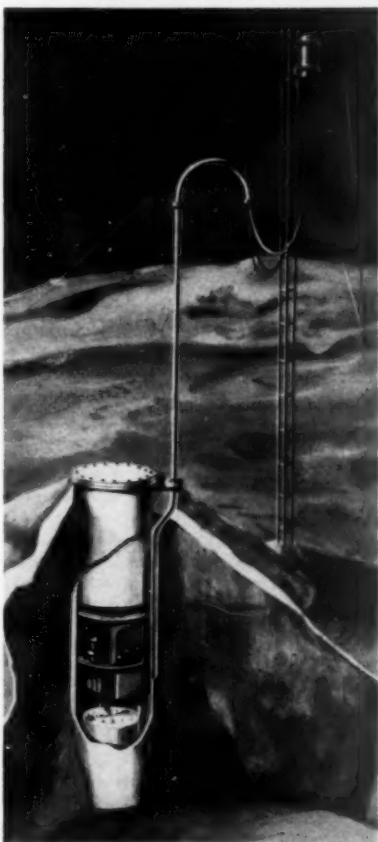
The Transit nuclear battery uses plutonium-238, whereas the weather station's five-watt battery is powered by radioactive strontium titanate. The AEC said this battery will not need any maintenance and will last for at least ten years, making it extremely well suited for a weather station in such an inaccessible place as the North

Pole. The transmitter is scheduled to be installed at the pole during this summer.

If this weather station proves successful, more may be placed in other isolated areas, difficult to reach and where no one lives.

The power source is enclosed in a container that should last the life of the battery. However, even if it were broken open, the strontium titanate is insoluble and could not be absorbed by water and plants and ultimately animals and humans. Therefore there should be no potential danger from the nuclear fuel.

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NUCLEAR WEATHER STATION

TECHNOLOGY

New Auto Safety Signals Brighter in Daylight

► A "DUAL INTENSITY" lighting system for rear turn and stop signals, designed to increase their daytime visibility without making them too bright at night, is expected to be adopted by U.S. automobile manufacturers as soon as preliminary work is completed.

The new signals will be two to four times brighter in daylight than those now in use, but the rear signal brightness will be lowered when headlights are turned on. A research group from the Automobile Manufacturers Association in Detroit developed prototype units in cooperation with U.S. lamp manufacturers.

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MEDICINE

Drugs Lower Cholesterol

► **THE COMBINED ACTION** of another drug with MER-29 gives excellent results in lowering cholesterol when patients with hardening of the arteries do not respond to MER-29 alone.

MER-29 (triparanol) was released for prescription use just before the American Medical Association meeting in 1960. Now the 1961 AMA meeting in New York has been told that MER-29 is usually effective but that the combined, or synergistic, action of a second drug may be even better.

Dr. William Hollander of Massachusetts Memorial Hospitals, Boston, reported that he and his colleagues had treated 85% of more than 100 patients successfully with MER-29 alone.

"However," Dr. Hollander said, "three-fourths of the patients would do better with the combined action of another drug. The drugs we use are Nicalax (aluminum nicotinate), which is available through prescription, or D-thyroxine, which is not on the market.

"D-thyroxine, which is a thyroid-like compound, should be given in small doses if pain is present in cases of arteriosclerosis, although if no pain is present, larger doses will do more good." This is because D-thyroxine aggravates the pain.

Asked if he believes high cholesterol levels are responsible for arteriosclerosis (hardening of the arteries), Dr. Hollander told *SCIENCE SERVICE* that "there is a large body of clinical evidence for an important relationship between cholesterol metabolism and arteriosclerotic heart disease."

Working with Dr. Hollander on the research he reported were Drs. A. V. Chobanian and Robert W. Wilkins, also of Massachusetts Memorial Hospitals.

• *Science News Letter*, 80:38 July 15, 1961

Protect From Quacks

► **PHYSICIANS** at the American Medical Association meeting in New York were told they should protect society from the "buffoonery of the food quacks" by Dr. Fredrick J. Stare of Harvard Medical School.

Dr. Stare challenged the medical profession to learn more about modern nutrition as probably the "most important single environmental factor affecting health."

People should cut down on their caloric intake without cutting out all fat, Dr. Stare said. Sensible eating and moderate exercise would probably reduce the high rate of heart disease among normally healthy persons.

For those with high cholesterol levels, the professor of nutrition advised gradually reduced fat intake. But he said he had no proof that this would eliminate heart attacks.

Modern nutrition can help in the control of a variety of diseases from diabetes to kidney stones, Dr. Stare said.

"For the first time research holds out hope of lessening the formation of calcium

oxalate stones in the kidney and bladder," he told the physicians. These stones can be produced experimentally in nearly 100% of test animals by diets low in pyridoxine and magnesium, and prevented by increasing the dietary level of these two nutrients, he explained.

Adequate calories can now be given to acutely ill patients through development of a fat emulsion that can safely be given in the veins, Dr. Stare said.

"Vitamins can readily be added to such an emulsion, and when one can add a protein digest or amino acids and minerals one should have convenient and effective complete parenteral nutrition."

Dr. Stare assailed "self-righteous pseudoscientists" who are preventing water fluoridation in the face of overwhelming scientific evidence that it reduces tooth decay.

• *Science News Letter*, 80:38 July 15, 1961

Medicine in Space

► **"HARDWARE TECHNOLOGY"** is passing medicine in the race for space, Brig. Gen. J. W. Humphreys Jr. of Lackland Air Force Base, Texas, told the American Medical Association meeting in New York.

"During the initial stages of our conquest of space," Gen. Humphreys said, "adequate medical support will probably exceed the capabilities of any one of our present military medical departments and it is probable that a combined biomedical space support task group will be required."

Gen. Humphreys said his viewpoint did not necessarily coincide with that of the Air Force, but that he believed a single agency would be necessary. A full-time medical support task group composed of selected members from all agencies involved would also be needed.

Referring to the flight of Cmdr. Alan B. Shepard Jr. into space, Gen. Humphreys said in the coming months a man will take the much longer step into orbital flight. From then on, in the foreseeable future, space craft will be orbiting the earth.

The general warned that adequate medical support would be costly in money, material, and skilled medical and allied science manpower. Today's medical recovery operations are archaic, he pointed out. In the future they must be replaced with locations on space stations manned by a "well-founded generalist" (not a specialist) and considered a satellite of the main ground base.

The health of crewmen was emphasized by Gen. Humphreys, who said that "physicians must be responsible for not only the general physical well-being of the space crewman, but also be sure that he is not in the incubation phase of a disease."

On a trip to a far target such as the moon, requiring six to nine days, or to Mars, taking seven to nine months, Gen. Humphreys said, a chronic condition such as peptic ulcer or ileitis could cause serious trouble.

Brig. Gen. Don Flickinger, M.D., of An-

draws Air Force Base, Washington, D. C., said Cmdr. Shepard's achievement "used up a generation of knowledge." More technology must be developed before moon flight is possible.

• *Science News Letter*, 80:38 July 15, 1961

Value of Drugs

► **DOCTORS WANT** doctors, not the Food and Drug Administration, to decide the value of prescription drugs.

At the American Medical Association meeting in New York, the policy-making House of Delegates voted that only a physician can tell how effective a given drug will be for the individual patient.

Sen. Estes Kefauver (D.-Tenn.) has proposed legislation authorizing the Food and Drug Administration to determine the value of prescription drugs as medicine. AMA spokesmen appeared before the committee.

The House of Delegates also voted to oppose the King-Anderson bill and any other legislation of this type that would use the Social Security system to provide medical care for the aged. It said that the medical profession would "see to it" that every person received the best available medical care, regardless of ability to pay.

Among the 102 resolutions presented to the House of Delegates were those recommending that the relationship of osteopaths and physicians be left to individual states, that optometrists confine their activities to refraction of the eyes only, that the medical profession discipline its own members when necessary, and that the Government appropriate funds for building fallout shelters.

• *Science News Letter*, 80:38 July 15, 1961

Winners at AMA Meeting

► **TWO SCIENCE-MINDED** youngsters who won top honors from the American Medical Association at this year's National Science Fair-International exhibited their research projects at the annual AMA meeting in New York.

Rita C. Manak, 16, a senior at Lourdes Academy in Cleveland, Ohio, won her New York trip for research on the biochemical aspects of leukemia. Christopher G. Cherniack, 16, Eau Gallie, Fla., a junior at Melbourne High School, Melbourne, was cited for keeping nerve fibers functioning after removal from an animal's body.

Earlier, they were winners at preliminary fairs in their home states. Rita also won a Westinghouse Science Award in the 1961 Science Talent Search.

At the national fair in Kansas City, young Cherniack became the top all-time winner, taking first-place special awards from the AMA, the Army, the Navy and the Air Force, as well as placing second in general judging in the biological sciences.

AMA participation in the annual National Science Fair-International, conducted by *SCIENCE SERVICE*, Washington, D. C., is part of the organization's program to interest talented high school and college students in medical careers.

• *Science News Letter*, 80:38 July 15, 1961

MEDICINE

Premature Births Cut

► **BIRTH OF PREMATURE** infants was prevented in 43% of 156 mothers who were given a muscle-relaxing drug called isoxsuprine, Dr. Edward H. Bishop of the University of Pennsylvania School of Medicine has reported.

Obstetricians all too often accept premature births as an inevitability, he told an American Medical Association meeting in New York.

"This seeming indifference," he said, "may be nurtured by the fact that this complication does not threaten the life of the mother." But premature labor has no peer as a threat to the welfare of the unborn child, he added.

Major obstetric complications include toxemia, hemorrhage and infection, and advances are being made in the treatment of these conditions. Some investigators have reported studies showing that inadequate nutrition and small heart size in the mother are contributing causes to premature labor.

However, Dr. Bishop pointed out, the vast majority of premature infants are born of apparently normal mothers after an apparently normal prenatal course. Until the causes of premature labor are clarified, he said, symptoms must be treated.

The onset of uterine contractions is usually what alerts the obstetrician to the danger of premature birth. In the 156 patients

with whom Dr. Bishop worked during a two-year period, pregnancy had advanced from 20 to 36 weeks and usually the membranes had not ruptured, inasmuch as he believes there is some question regarding the wisdom and safety of putting off delivery under these circumstances.

Initial dosage by intravenous route consisted of 30 milligrams of isoxsuprine diluted in 200 cubic centimeters of five percent glucose in water and administered at the rate of 40 to 50 drops a minute.

Afterward, Dr. Bishop administered 10 milligrams of the drug intramuscularly every three hours. Then after the first 24 hours of treatment, the medication was given either orally or intramuscularly depending on the uterine activity.

Once uterine contractions had stopped for 48 hours, the patient was usually discharged from the hospital and a maintenance dose of 10 milligrams four times a day orally was continued for at least two weeks.

No effect on labor was achieved in 25% of the cases studied. A temporary cessation of labor followed by a recurrence after a short period of time occurred in 11.5%. In a third group of patients, recurrence of premature labor was delayed for one week or longer, but still resulted in delivery of an infant weighing less than five pounds.

However, Dr. Bishop believes that delay

was worthwhile through allowing more time for fetal growth in the ideal environment and thereby increasing the chance of survival.

• Science News Letter, 80:39 July 15, 1961

PUBLIC HEALTH

Stagger Housework Before It Staggers You

► **THE SO-CALLED** efficient housewife got no praise from Dr. Janet Travell, personal physician to President Kennedy, when she told YWCA health and recreation leaders in Washington, D. C., how to keep from straining their backs at household tasks.

"The more efficient you are, the worse you will come out," Dr. Travel warned, explaining that the woman who does all her ironing on one day would do better to iron 15 minutes for five days.

The President's physician advised a rhythm of movement, and the avoidance of speed. Housework can be done like a modern dance, she said, with frequent rests of two to five minutes. "There really is a limit to what you can do."

Other advice from Dr. Travell:

Better make two trips to the market than carry one bundle that will overreach your strength.

Do not tolerate bad physical or mechanical arrangements in your home. If the sink is too high, use a stool or chair.

Take a variety of exercise to avoid overuse of a special set of muscles.

Exercise should be fun. If you cannot take much exercise, use a well-proportioned rocking chair. (It was Dr. Travell who recommended a rocking chair for President Kennedy.)

Pace yourself. Do not kill yourself doing housework. Be a homemaker instead of a houseworker.

Take your own advice about what you should do to avoid fat or fatigue. You know you need more exercise and less food.

The doctor's dilemma is not in choosing between wonder drugs but in getting people to do what they know is good for them.

• Science News Letter, 80:39 July 15, 1961

PUBLIC HEALTH

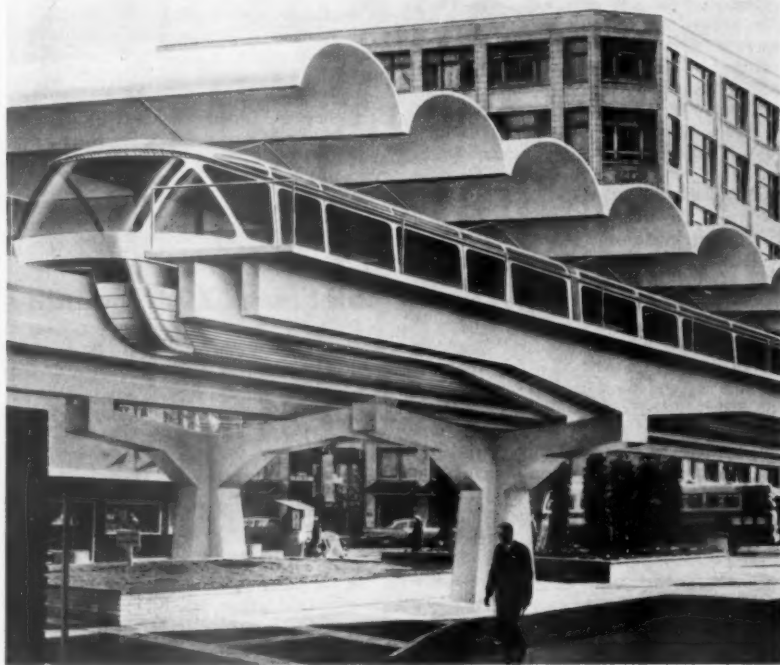
Water Pollution Increasing in Europe

► **EUROPE**, like the United States, has a water pollution problem. Such world-famous beautiful rivers as the Rhine in Germany are receiving increasing amounts of industrial wastes, triggered by the post-war industrial boom in Europe.

European scientists are currently working on the problem to see if they can cut down the dirtying of the waters, Dr. Sherman W. Gillam of the U. S. Department of Interior's office of saline water reported.

No extensive work on de-salting the oceans is being conducted in Western Europe because of the abundant fresh-water supply, Dr. Gillam noted. However, Algiers, on the African coast, is currently working on solar evaporation in conjunction with French scientists and engineers.

• Science News Letter, 80:39 July 15, 1961



HIGH-SPEED MONORAIL—10,000 passengers an hour can be carried on a 95-second schedule along a 1.2-mile monorail track that will be built from downtown Seattle, Wash., to the Century 21 Exposition in 1962. The downtown terminal with one of the train's electric Alweg monorail cars is sketched above.

PUBLIC HEALTH

Retarded Children Now Helped in 46 States

► FORTY-SIX STATES are now offering clinical services for retarded children, as opposed to only four states in 1957, the Children's Bureau testified in hearings of the subcommittee of the House Committee on Appropriations in Washington, D. C.

Dr. Arthur J. Lesser, director of the Children's Bureau division of health services, said there are now 82 special clinics for retarded children in the United States, and 50 of these have been developed through the maternal and child health program.

Milk-free diets for infants with phenylketonuria, a metabolic disorder among the new-born, usually prevent a very severe form of mental retardation, and Dr. Lesser said particular attention has been given to this problem in the past year.

In well-baby clinics at least 25 infants under one year of age were found to have phenylketonuria and placed under treatment in 1960 so they have a chance to grow up normally.

From an economic standpoint alone, Dr. Lesser said the results are estimated as saving about \$2,000,000 through prevention of retardation of this small group of children.

The Children's Bureau reported that approximately 200,000 mentally retarded children and adults are being given residential care away from home. More than 90% are being cared for by 104 state institutions operated by 49 states at an annual cost to these states of more than \$250,000,000.

• Science News Letter, 80:40 July 15, 1961

EDUCATION

Two-Way System New to TV Teaching

► A NEW SYSTEM of electronic instruction attempts to combine televised lectures with the person-to-person, "coach-pupil" technique of individual tutoring.

The equipment, called Teletest Communications, was demonstrated in Washington, D. C., by Dr. Robert E. Corrigan, president of Corrigan Associates, Inc., Garden Grove, Calif. It was shown to members of a House subcommittee on communications and power, now considering proposed legislation on educational television.

With Teletest, students not only watch and listen to lectures, but actively participate by responding at intervals to the teacher's questions. Their answers to multiple-choice queries are recorded on an IBM card, inserted in a small machine at each listener's desk.

In the studio, the teacher gets an immediate tabulation of the number and percentage of correct answers. He knows at once if his material is "getting across." Students also know at once if their answer was correct, from a signal transmitted from the "answer selector console" for reading by three photoelectric cells at the bottom of

each receiver, and subsequent relay to each "student station."

Present "student answer" mechanisms are about the size and shape of a small adding machine. Newer models, however, will be "approximately the size of a telephone pad," Dr. Corrigan said.

Teletest may be used with either closed-circuit or open-circuit transmission, with any standard receiver. It is now in use on a test basis in the Anaheim, Calif., School District Television Program and at San Jose, Calif., State College.

Dr. Corrigan estimates cost at about \$3,700 for a transmitting and receiving set-up serving 30 students. Mass production may bring prices down, he said.

• Science News Letter, 80:40 July 15, 1961

FORESTRY

Soviet Method Treats Wood of Standing Trees

► AFTER TEN YEARS' research, a Russian scientist has disclosed new methods of treating trees on the stump so that they can be preserved, tinted, air-dried, and made fire-resistant and pliable.

The four-stage treatment outlined by P. S. Zakharov, who worked with the Soviet Ministry of Forest Production, causes wood dried while still standing to lose about half its weight, with no warping or cracking. Drying time is shorter than that of cut wood.

The tree is first girdled—that is, a ring of bark is removed from its butt part.

Next, canals are drilled along the girdle to stop assimilation of water from roots, and a network of glass or metal tubes inserted.

Chemical solutions are then introduced into the tubes from a bag hung on the tree. Main component of the solution, Mr. Zakharov reports, is powdered sodium fluoride, dissolved in pure, filtered water and laced with Petrov contact to decrease leaching of preservatives.

Finally, the tree and its canals stay "on the stump for a certain length of time with or without treatment," Mr. Zakharov explains. Wood dries in three to four summer months, compared to about a year for felled logs.

Other chemicals can be added to impart special properties to the wood, he said. Sodium dinitrophenolate is a preservative, but makes wood more combustible. Antipyrone makes it fire-resistant. Silica salts will harden a tree so it cannot be chopped or sawed. Acetic acid gives an orange coloring to birches and beeches. Treatment with dicyanodiamide and urea made a birch so flexible, in one experiment, that "after long treatment . . . (it) was bent in an arc with the green crown touching its own root."

Mr. Zakharov claims the simple techniques and apparatus, plus ready availability of most solutions used, make his methods economical and of wide interest to those in the wood-treating field.

His full report, translated from the Russian, has been published by Consultants Bureau.

• Science News Letter, 80:40 July 15, 1961

IN SCIENCE

DENTISTRY

Dental Instruments Transmit Hepatitis

► DENTISTS as well as physicians can transmit viral hepatitis to patients by using needles and syringes contaminated with another patient's blood.

Instruments should be thoroughly sterilized, Dr. Holmes T. Knighton of the Medical College of Virginia, Richmond, reported in the *Journal of the American Dental Association*, 63:21, 1961.

Amounts of blood so minute as to be nearly invisible from a patient with serum hepatitis have produced viral hepatitis in human volunteers. Larger but still minute amounts of diseased blood from a patient are needed to produce infectious hepatitis.

Dr. Knighton said "very good circumstantial evidence" has been offered in previously reported hepatitis cases to show that some dentists 'have been guilty of negligence in sterilizing their instruments sufficiently.

Dentists should use every possible precaution to sterilize all instruments capable of "transferring blood or blood products from one patient to another."

"Although the use of needles and syringes is the most likely avenue of such transfers, it should be remembered that instruments such as scalpels, forceps, periodontal instruments and others that are used to penetrate tissues are always potential carriers of the viruses in the blood or blood products unless they are adequately sterilized," Dr. Knighton said in his report, prepared at the request of the ADA Council on Dental Therapeutics.

• Science News Letter, 80:40 July 15, 1961

METEOROLOGY

U. S. Weather Bureau Celebrates 70th Birthday

► THE U. S. Weather Bureau is now 70 years old.

Although the butt of many comments about weather prediction, the Weather Bureau has actually "kept pace with the developments of the space age," Secretary of Commerce Luther H. Hodges told the Weather Bureau. No other agency of Government is put to the test of ability with such frequency yet comes out with such high grades, he said.

When the Weather Bureau was organized as a civilian agency on July 1, 1891, by an Act of Congress, weather men based their forecasting on limited surface weather observations. Today, huge mobile and stationary networks span the country and surrounding seas, guarding against hurricanes and other destructive weather until the weather satellite network is lofted in the near future.

• Science News Letter, 80:40 July 15, 1961

NE FIELDS

PUBLIC SAFETY

Safer Design of Vehicles Would Lessen Accidents

► **CAR DESIGN** is to blame for many traffic deaths, autopsies of accident victims in Birmingham, England, have revealed. But careless behavior of pedestrians is also a factor.

The current trend of car design, researchers have noted, is toward increasing power over weight. Yet there should be a minimum standard for the strength of the passenger compartment.

Other suggestions that would make for fewer and less severe car-pedestrian collisions:

Make the hood slope so the driver can clearly see even small children in front of the car.

Improve the steering and general control of the vehicle.

Eliminate sharp external fittings.

Bring truck bodies closer to the ground to avoid the possibility of rear wheels running over persons ejected from other vehicles.

Secure fixation of all seats and cushions and the wearing of safety belts. None of the casualties studied had been wearing such belts.

The first of a series of road death studies expected to continue for the next six years is reported by Drs. William Gissane and John Bull of the Birmingham Accident Hospital in the *British Medical Journal*, June 17, 1961.

• Science News Letter, 80:41 July 15, 1961

PUBLIC HEALTH

Polluted Air Causes Rise in New York Deaths

► **AIR POLLUTION** in New York caused a marked increase in deaths while a blanket of smog hung over the city.

A statistical check of the death rate during a smoggy period in November, 1953, showed an upward surge that could only be attributed to air pollution, reported a study group headed by Dr. Leonard Greenburg, chairman, Department of Preventive and Environmental Medicine, Yeshiva University's Albert Einstein College of Medicine in New York.

Weather conditions leading to smog entered the New York area on Nov. 12 and lasted until Nov. 21. The death rate jumped up on Nov. 15, three days after the air pollution weather pattern arrived, and stayed high until exactly three days after the pollution diminished.

During the high period, the average daily death rate rose to 244, whereas the average during two three-year control periods was between 218 and 227.

The smog was caused when a warm air mass hovering over the city, acted as a lid,

preventing the surface polluted air from rising and escaping. Numerous complaints of eye irritation and coughing were reported by city residents during this period.

"The study was the first of its kind in the United States," a U. S. Public Health Service expert said. Previous studies were mostly confined to comparisons of urban and rural groups because of the absence of air-sampling data.

The New York City air-pollution control department has maintained an air-sampling network for many years, and the Public Health Service coordinated their system in 1957.

The New York study was initiated to show how "air pollution affects health even when the degree of pollution is not so intense and the amount of illness not so dramatic as to demand instant public attention," the report stated. "Numerous studies along these lines are now in progress."

The study was financed by a grant from the U. S. Public Health Service.

• Science News Letter, 80:41 July 15, 1961

PUBLIC SAFETY

Standards to Undertake Extended Fire Research

► **THE NATIONAL** Bureau of Standards is now testing the rate and temperatures of "burning walls," using a computer to do it instead of burning the wall.

The Bureau has been asked by the National Academy of Sciences to take over a national program of fire research to study the "mechanisms" of fire: why do things burn, and how can fires be extinguished. Such research will deal with the whole problem of unwanted fires that cause loss of life and property.

In order to test how walls burn without burning them, a computer is programmed with the properties of the wall. Then the mathematics of the rate of burning and temperature are fed into the machine, and the requested answers are given by the computer.

An expanded program of fire research will be undertaken by the Bureau at its new \$104,000,000 home that is scheduled to be finished between 1963 and 1965.

Ground has now been broken at Gaithersburg, Md., for the new Bureau site.

• Science News Letter, 80:41 July 15, 1961

ENGINEERING

Engineers Found Still in Demand

► **WITH THE MARKET** for graduating engineers reportedly tight, a survey of 1961 graduates in 49 schools shows engineers are still in demand. The Engineering Manpower Commission found 83.8% definitely committed to jobs, military service, graduate studies or other plans.

The 1960 figure was 84.4%. A three percent drop among those with jobs is offset by a two and one-half percent increase in those going into graduate study and a nine-tenths of a percent increase in those slated for military service, the Commission reported.

• Science News Letter, 80:41 July 15, 1961

HORTICULTURE

Less Lighting Cuts Cost Of Plant Growth Control

► **GROWTH OF PLANTS** under artificial light can be controlled by applying the light at short, regular intervals totaling only 12 minutes during the night, U. S. Department of Agriculture researchers have found.

By using alternating cycles of light and darkness, plant growth can be regulated to save nurserymen as much as 95% of their lighting costs. Four hours of continuous light are now used in most commercial greenhouses to get the same results.

Since it will greatly reduce lighting costs, the new concept of "cyclic lighting" is expected to lead to controlled growth of many more plant species, including crop plants, trees and shrubs. Currently, only valuable plants such as chrysanthemums get the control treatment so they will mature at times when they are most in demand.

Phytochrome—the light-sensitive pigment found in all plants—reacts to darkness by slowly changing form, gradually losing its growth-controlling effectiveness.

Working at the Agricultural Research Center in Beltsville, Md., horticulturist H. M. Cathey and plant physiologist H. A. Borthwick learned that controlled growth would continue unhampered if dark periods did not exceed one hour, after each period of artificial light during the middle of the night.

Acting accordingly, they used such lighting cycles as three seconds of light every minute for four hours, 30 seconds every ten minutes for four hours, or 90 seconds every 30 minutes for four hours—each totaling 12 minutes.

• Science News Letter, 80:41 July 15, 1961

MEDICINE

Open Heart Operation Saves Pregnant Woman

► **FOR THE FIRST TIME**, an expectant mother survived an operation in which a heart-lung machine handled the patient's total blood circulation. This is called total body perfusion.

The machine takes over the work of the heart and lungs while the heart is being operated on.

The infant was born five months after the operation but had a number of defects and died four months later. The mother later gave birth to a healthy son. Drs. Robert Leye, Milford Ofstun, David H. Dillard and K. Alvin Merendino of the University of Washington School of Medicine, Seattle, report the case in the *Journal of the American Medical Association*, 176:1009, 1961.

A severe congenital heart defect in the 23-year-old patient that was associated with an unusual combination of circumstances made the operation necessary. Fortunately, the physicians state, the need for total body perfusion for correction of a heart defect in an expectant mother is extremely rare.

• Science News Letter, 80:41 July 15, 1961

PUBLIC HEALTH

The Case Against Alcoholism

Alcoholism is a disease and a social problem. It affects family life, the crime rate, deaths from accidents and the number of patients in mental hospitals, Faye Marley reports.

► ONE OUT OF EVERY 15 persons who drink becomes an alcoholic according to present estimates. But only three percent of this number will be found among the Skid Row derelicts.

Of the 5,000,000 alcoholics in the United States, there are around 2,000,000 alcoholics, many of them unrecognized, working in the professions, business and industry. Many are in the early or middle stages of alcoholism, and can be helped before their problem becomes acute.

The National Institute of Mental Health, National Institutes of Health, Bethesda, Md., is spending \$1,900,000 this year in an effort to get more knowledge about the physical, psychological and social factors related to alcoholism.

Dr. Carl L. Anderson, Institute consultant on alcoholism program services, told SCIENCE SERVICE that in his travels to various states he finds that people are more readily seeking treatment as alcoholism becomes less of a stigma.

"It used to be that tuberculosis and venereal disease carried such a stigma that they were not openly discussed," Dr. Anderson said. "Now the public schools as well as the medical schools are giving more attention to alcoholism, which is still an area of high emotion."

Some physiology textbooks do not even mention alcohol. Others refer to it as a poison, which makes students wonder why their fathers who drink beer occasionally are still alive.

More Research Needed

More research is needed to find out the point at which a person becomes an alcoholic and what makes him lose control of his drinking.

At hearings before a House subcommittee on appropriations for 1962, Dr. Robert H. Felix, director of the National Institute for Mental Health, reported that 56,216 persons were under care for alcoholism in public mental hospitals in the United States during 1959, the last year for which figures are available.

"There are two kinds of alcoholics," Dr. Felix reported. "You have the so-called spree-drinking alcoholic," who may be on a binge for two to ten days or so after two or three months of being perfectly dry. These persons apparently are not damaged as much as the person who drinks more steadily.

The steady drinker, on the other hand, may consume two or three fifths of liquor a day, or more. There may be brain damage, harm to the peripheral nerves and frequently a psychosis. Also the nutrition is impaired, inasmuch as such persons often

reach the point where they are drinking and not eating.

The Institute's alcoholism program is directed toward getting knowledge on alcoholism problems and finding out what further research is urgently needed. Dr. Nevitt Sanford, professor of psychology at the University of California, is scientific director of a project by the Cooperative Commission on the Study of Alcoholism, which is being supported by a research grant from NIMH.

In the division of alcoholic rehabilitation of California's State Department of Public Health alcohol usage patterns are being studied. In an attempt to measure deviation in drinking patterns, this project will develop "instruments for gathering data about nonpathological alcohol consumption."

A Colorado study under an Institute grant will deal with "the values and habits surrounding alcohol usage as they are affected by the cultural factors of various ethnic groups."

The second year of a four-year demonstration on public health approach to problems of alcoholism in the family is con-

tinuing in Prince Georges County, Md., through cooperation of the Institute's Mental Health Study Center and the County Health Department.

This pilot project aims at rehabilitation of the alcoholic and his or her family through the combined efforts of appropriate community facilities, development of an educational and preventive program, and evaluation.

Dr. Marvin A. Block, of the University of Buffalo School of Medicine, chairman of the American Medical Association Committee on Alcoholism, said that almost every medical college includes some teaching on alcoholism.

The AMA Committee on Alcoholism, Dr. Block said, has worked out a comprehensive curriculum that has been approved by the Association of American Medical Colleges, and as a result, more medical students are coming out better equipped to handle alcoholics.

"Our idea is to teach alcoholism not as a subject," Dr. Block explained, "but as it is related to medical, psychiatric and sociologic problems. Alcoholism is a part of our culture, and we must learn to discern the difference between social drinking and drinking as an illness."

Among courses recommended throughout four years of medical college are the physiology of alcohol, its biochemistry and



SUBSTITUTE DRINK—The executive on the job is helped if an understanding friend brings him coffee when the need for alcohol overcomes him, as shown in this posed photograph.

related psychiatry, the action of alcohol as a drug and as an addictive drug, the treatment of alcoholism with the drugs Antabuse and Temposil.

Also recommended are courses in demonstration of changes in body systems associated with chronic alcoholism, neurological signs, liver findings and motivations for psychiatric treatment. Students also should learn something about forensic medicine, about laws on the management of the non-cooperative alcoholic.

Both the AMA and the American Hospital Association have recommended admittance of alcoholism patients to general hospitals. Since only a minority of such patients are uncooperative, these hospitals have been urged to "base the decision as to admission or non-admission" upon the condition of the individual patient.

The individual differences in alcoholic patients was pointed out by Dr. Carl G. Jung, the psychiatrist who died recently at the age of 85.

Dr. Jung told a businessman alcoholic patient that he might be one of those rare cases who made a recovery even though he had become intoxicated after leaving the psychiatrist's care, and returned in acute depression.

Once in a while, said Dr. Jung, alcoholics have had vital experiences in the nature of huge emotional displacements. Ideas, emotions and attitudes that were once the guiding forces of these men are suddenly cast to one side, and a completely new set of conceptions and motives begin to dominate them.

His businessman patient had such an experience and lost his obsession to drink. He was partly instrumental in starting Alcoholics Anonymous. There are 12 steps suggested to alcoholics by A. A. Boiled down, they mean first, admission of alcoholism; second, personality analysis and catharsis; third, adjustment of personal relations; fourth, dependence on a higher power; and fifth, working with other alcoholics.

Al-Anon and Alateen, an outgrowth of Al-Anon, which is closely allied with Alcoholics Anonymous, include family groups and teen-agers, respectively. Information about both these programs can be obtained from P. O. Box 182, Madison Square Station, New York 10.

The National Council on Alcoholism, 2 East 103 St., New York 29, is the national voluntary health agency for control of alcoholism.

• Science News Letter, 80:42 July 15, 1961

portable field missile system that can be operated by two or three men.

The programmer-timer operates according to the advance instructions given to it before the missile is launched. The built-in logic system tells the power-handling equipment "when to go and when not to go".

Production costs, based on limited output of a few units each month, are estimated at \$750 to \$1,100 per unit.

• Science News Letter, 80:43 July 15, 1961

Transmitter for Space

► DEVELOPMENTS of the first solid-state microwave transmitter for space communications was reported by General Telephone and Electronics Corporation, New York, at the National Convention on Military Electronics in Washington, D. C.

The compact new unit, smaller than a cigarette carton, occupies about one-seventh the space required for conventional transmitters, and reportedly has 11 times the life expectancy and 10 times the frequency stability.

The transmitter could be linked with a solid-state radio receiver to form a complete space communications system. It is adaptable to space probes or communications relay satellites.

The engineering model, shown at the meeting, weighs about three and one-half pounds. It has an operating life expectancy of more than two and one-half years.

It operates with two watts of output power within the S-Band—1,700 to 2,300 megacycles. This is believed to be the minimum power and frequency requirement for transmitting information between two points on the earth by way of a relay satellite in a stationary equatorial orbit.

The transmitter was developed for the Air Force by Sylvania Electric Products, Amherst, N. Y., under a \$95,000 study contract. Supplemental awards total about \$1,000,000. Sylvania is a subsidiary of General Telephone and Electronics Corporation.

• Science News Letter, 80:43 July 15, 1961

ANIMAL HUSBANDRY

Breeding Not Feeding Makes Steak Tender

► IT IS BREEDING, not feeding, that makes a tender steak, scientists at the Florida Agricultural Experiment Stations, Gainesville, Fla., have discovered. Popular opinion, backed by Federal meat grading standards, holds that the most tender cuts of beef are the more expensive, well-marbled ones.

But Drs. A. Z. Palmer and J. W. Carpenter of the Gainesville staff, and Dr. W. G. Kirk of the Range Cattle Experiment Station in Ona, have found that marbling actually has very little to do with tenderness, although a certain amount is desirable for juiciness.

Breeding is the biggest factor in tenderness, the scientists said. Some bulls sire calves that have tender meat, while others sire only tough-meat calves.

• Science News Letter, 80:43 July 15, 1961

OCEANOGRAPHY

Oceanographic Research

► AN EXPANDED oceanographic research program is vitally necessary for the national defense.

Although increased knowledge of the oceans is seen by many as a solution of any future United States food and water problems, the U. S. Navy pointed to the need for protecting U. S. shores from a nuclear submarine attack.

Reports about the Russian build-up of a fleet of nuclear submarines and the reportedly porous U. S. submarine defense system has forced the Navy to make an all-out effort to plug up these gaps.

A 10-year, \$1 billion naval underwater research program (TENOC 1961-1970) has been set up to learn more about the environment in which U. S. defense systems will be operating. Scientists must learn more about such important variables as

currents, salinity and noise levels before they can make detection equipment more accurate and reliable.

A new anti-submarine experimental program under the code name Artemis "has evolved from the Navy's basic and applied oceanographic research program," Rear Adm. L. D. Coates, chief of the Office of Naval Research, told a House subcommittee hearing on oceanography in Washington, D. C. The hearing was on a House bill to expand and coordinate oceanographic research.

Adm. Coates also gave credit to oceanographers at private institutions who through their research not only push back the frontiers of oceanography but also increase the effectiveness of naval operations.

• Science News Letter, 80:43 July 15, 1961

ROCKETS AND MISSILES

Missile Clock Computer

► AN ELECTRONIC clock computer for missile systems, first of its kind to be readied for actual use, had its first public showing at the three-day National Convention on Military Electronics in Washington, D. C.

The tiny, microminiaturized device is small enough to fit into a soup can. It weighs only 14 ounces, compared to the 15 pounds of the mechanical unit now used in the Bomarc missile.

Representatives of Cleveland (Ohio)

Metal Specialties Company, where the system was packaged, and the U. S. Army's Diamond Ordnance Fuze Laboratories, Washington, D. C., where it was designed, said the ultra-compact unit is "10 to 100 times more accurate" than standard mechanical systems now used in ballistic missiles.

The research prototype has been successfully test flown in five different Army missiles. For actual use, the Army will concentrate first on its application to a small,

Books of the Week

For the editorial information of our readers, books received for review are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C.

ABUNDANCE OF CHEMICAL ELEMENTS—V. V. Cherdynse, transl. from Russian by Walter Nichiporuk—*Univ. of Chicago Press*, 304 p., \$10. Revised translation of 1956 monograph on the abundance of elements from the viewpoint of the stability of the atomic nuclei.

THE ACHIEVEMENT OF SOVIET MEDICINE—L. Fridland, M.D.—transl. from Russian, foreword by W. Horsley Gantt, Ed.—*Twayne*, 352 p., \$6.50. Translation of a popular Russian book on the advances of Russian medicine under the Soviet regime.

BLACK GOLD: The Story of an Oil Pioneer—Arthur Beeby-Thompson, foreword by Herbert Hoover—*Doubleday*, 544 p., photographs, \$5.95. Experiences and observations of an eminent British petroleum engineer who practised his profession for 60 years in almost every part of the world.

BONE: An Introduction to the Physiology of Skeletal Tissue—Franklin C. McLean and Marshall R. Urist—*Univ. of Chicago Press*, 2nd rev. ed., 261 p., illus., \$6. Concise statement of the present status and important advances in the fields of the physiology and biochemistry of the bone.

CELL MECHANISMS IN HORMONE PRODUCTION AND ACTION—P. C. Williams and C. R. Austin, Eds.—*Cambridge Univ. Press*, 173 p., illus., \$7.50. Proceedings of a symposium held in 1960 by the Society for Endocrinology as an inquiry into the processes of hormone synthesis and secretion, and of the effects of hormones on cells.

A CHRONOLOGY OF MISSILE AND ASTRONAUTIC EVENTS: House Report—Committee on Science and Astronautics, U. S. Congress—GPO, 189 p., paper, 55¢. Summary of satellites and planetooids, and check lists of other launchings.

THE DESIGN OF RESEARCH LABORATORIES—Nuffield Foundation Division for Architectural Studies—*Oxford Univ. Press*, 211 p., illus., \$7.20. Report on an investigation into the function and design of research laboratories, with chapters on noise, vibration, fire safety precautions, materials and finishes.

DIABETICS UNKNOWN—Groff Conklin—*Public Affairs Committee*, Pamphlet No. 312, 28 p., illus., paper, 25¢ direct to publisher, 22 E. 38th St., New York 16, N. Y. Discusses symptoms and treatment of diabetes.

DSSERTATIONS IN PHYSICS: An Indexed Bibliography of All Doctoral Theses Accepted by

American Universities, 1861-1959—M. Lois Mackworth, Compiler—*Stanford Univ. Press*, 803 p., \$17.50. First single source book, reference tool for libraries, teachers and research physicists.

THE DRAGON TREE: A Life of Alexander, Baron von Humboldt—Val Gendron—*Longmans*, 214 p., plates from Humboldt's own works, \$3.95. Presents the life and work of the German explorer and scientist of the early 19th century.

ELEMENTARY MATHEMATICAL ANALYSIS—A. E. Labarre, Jr.—*Addison-Wesley*, 706 p., \$7.75. One-year foundation course for students who plan to major in mathematics, science, engineering or mathematical education.

THE EMPLOYMENT INTERVIEW—Milton M. Mandell—*Am. Management Assn.*, 110 p., paper, \$4.50. Discusses effective interview method, current administrative practices, areas needing improvement, and selection of interviewers.

ERROR-CORRECTING CODES—W. Wesley Peterson—*M.I.T. Press*, 285 p., \$7.75. Unified treatment of coding theory, for engineers or mathematicians who require thorough knowledge of coding.

FUEL ELEMENT FABRICATION: With Special Emphasis on Cladding Materials, Vol. I—International Atomic Energy Agency—Academic, 538 p., illus., \$14. Proceedings of a Symposium held in Vienna, May 10-13, 1960, attended by 200 scientists from 23 different countries.

FUNDAMENTALS OF UHF—Allan Lytel—*Rider, J. F.*, 153 p., illus., paper, \$3.90. Explains in some detail the basic features of ultra high frequency.

GENETIC ASPECTS OF DAIRY CATTLE BREEDING—Ivar Johansson—*Univ. of Ill. Press*, 259 p., illus., \$7.50. Surveys the present knowledge in regard to the genetics of economically important characters of dairy cattle and methods for their improvement.

MAN ON THE MOON: Our Future in Space—James Thorneburg—*Knopf*, 65 p., illus., by Peter Plascencia, \$2.75. Explains to children some of the problems involved in a moon landing.

MEMOIRS OF A MEDICO—E. Martinez Alonso—*Doubleday*, 335 p., \$4.50. Personal experiences of a Spanish physician.

METEOR SCIENCE AND ENGINEERING—D. W. R. McKinley—*McGraw*, 309 p., illus., \$12.50. Summarizes major observational and theoretical developments in meteor science, embracing the history of the particles and the effects they create in the upper atmosphere.

MODERN ALGEBRA: First Course—Richard E. Johnson, Lona Lee Lendsey and William E. Slesnick—*Addison-Wesley*, 628 p., \$4.95. High school algebra showing how modern algebra supplies a language and patterns of reasoning to the rest of mathematics.

MODERN DIELECTRIC MATERIALS—J. B. Birks, Ed.—*Academic*, 253 p., illus., \$7.50. Surveys dielectric and insulating materials used in mod-

ern electrical technology, including silicones, synthetic rubbers, ferroelectric ceramics and organic polymers.

NATIONAL INSTITUTES OF HEALTH: Scientific Directory, 1961 and Annual Bibliography, 1960—U. S. Public Health Service—GPO, 144 p., paper, 45¢. For reference use by research workers in the biomedical sciences.

THE NATURAL HISTORY OF THE LEWIS AND CLARK EXPEDITION—Introd. by Raymond Darwin Burroughs, Ed.—*Mich. State Univ. Press*, 340 p., \$7.50. Description of wildlife along the course of the Missouri and Columbia rivers, from the journals of Lewis and Clark.

NUMERICAL WEATHER ANALYSIS AND PREDICTION—Philip D. Thompson—*MacMillan*, 170 p., \$6.50. Primer of numerical prediction, stressing the fundamental physical and mathematical aspects of the subject.

OPERATIONAL ELECTRICITY: Theory, Characteristics, Applications, and Mode of Operation of Circuits and Machines—Charles I. Hubert—*Wiley*, 530 p., illus., \$8.50. Two-semester course intended for students enrolled in non-electrical engineering courses.

OPTIMUM DESIGN OF MECHANICAL ELEMENTS—Ray C. Johnson—*Wiley*, 535 p., illus., \$11.50. Presents explicit method of design that takes into consideration practical limitations unavoidable in real problems, and thus seeks to eliminate impractical design.

ORIENTATION TO ENGINEERING—A. W. Futrell, Jr.—*Merrill, C. E.*, 250 p., illus., paper, \$3.95. Discusses every phase of engineering and what are the qualifications and responsibilities of the professional engineer.

ORIGIN OF OIL AND OIL DEPOSITS—M. E. Al'tovskii, Z. I. Zuznetsova and V. M. Shvets; transl. from Russian—*Consultants*, 107 p., illus., \$17.50. On the results of field investigations of the content of organic substances and microflora in subsurface waters in oil-bearing and non-oil-bearing districts, and the significance of these substances in oil-forming processes.

PHYSIOLOGY: A Laboratory Manual—Nelle A. Hartwig and Donald A. Dickmann—*Burgess*, 4th rev. ed., 169 p., illus., paper, \$3.50. Simple exercises requiring a minimum of laboratory equipment.

THE PLASMA STATE—E. J. Hellund—*Reinhold*, 197 p., illus., \$6.50. Describes in non-mathematical terms the fundamentals and significance of highly ionized gases.

PROCEEDINGS OF THE SIXTH SYMPOSIUM ON MAGNETISM AND MAGNETIC MATERIALS: Supplement to the Journal of Applied Physics, Vol. 32, 1961—J. A. Osborn, Chmn.—*McGraw*, 400 p., illus., \$10. Papers dealing with pure physics and with applications, including thorough coverage of ferromagnetic resonance.

RADIOACTIVE WASTES: Their Treatment and Disposal—J. C. Collins, Ed.; foreword by Sir Alexander Fleck—*Wiley*, 239 p., illus., \$8. Contributions by British authorities with practical experience and fundamental understanding of the problems involved in disposing of radioactive solid wastes and radioactive gases.

THE THEORY OF SUBSONIC PLANE FLOW—L. C. Woods—*Cambridge*, 594 p., \$22.50. Systematic treatment of two-dimensional subsonic, inviscid fluid motion and its aeronautical applications, employing the same mathematical methods and variables throughout.

WILD WAYS: A Book of Animal Habits—Ross E. Hutchins—*Rand McNally*, 109 p., 50 photographs by author, \$3.50. Interesting stories about some unusual animal habits.

WITTON'S MICROBIOLOGY—Rewritten and revised by Genevieve Gray Young—*McGraw*, 3rd ed., 586 p., illus., \$8. Textbook on the relations between microorganisms and the human body in health and disease.

• Science News Letter, 80:44 July 15, 1961

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INVENTION

Patents of the Week

A launch system used for firing the submarine Polaris missile has been patented. A contact lens that allows normal flow of eye fluid was also invented.

► A MISSILE LAUNCH system used to fire the U.S. Navy's Polaris missile from a submarine has been patented.

Moses Siegel and Allan Honigman of the U.S. Naval Engineering Air Facility, Philadelphia, received patent No. 2,989,899 for a launching system that is presently being used in some submarines, probably with some modification, to fire the deadly missile. The Polaris is expected to play a large role in the retaliation of the United States in case of nuclear attack.

The missile is shot from a firing tube with the tremendous force generated by compressed air. The tube quickly floods "with water, balancing the missile weight of the unfired launchers," permitting the submarine to leave the area quickly.

Each launcher is a self-sufficient unit, housing the firing tube, power plant and control system. All launching units are completely loaded at the base, "avoiding the need of missile handling equipment aboard the submarine," the patent stated.

Although the U.S. Navy will neither officially confirm nor deny the association of the patent with the Polaris program, evidence strongly indicates it is currently being used.

A contact lens, claimed not to interrupt the normal flow of eye fluid was patented by Stanley Gordon, Brighton, N.Y., who assigned rights of patent No. 2,989,894 to Contact Lens Guild, Inc., Rochester, N.Y. Tiny channels etched on the inside of the lens "provide an ample and continuous distribution of eye fluid without altering the surface of the cornea," the patent stated.

A process for treating common table salt so that it has "little or no caking tendencies" when stored was patented by three Englishmen who awarded rights of patent No. 2,990,246 to Imperial Chemical Industries Limited, London. Salt containing the chemical nitrilotriacetamide "did not cake when stored under various unfavorable atmospheric conditions," whereas a similar batch without the chemical, stored under the same conditions, "formed hard lumps," the patent stated. Thomas R. Scott, Northwich, Norman G. Bromby, Woodford, and Coningsby Allday, Sandiway, England, won the patent.

Dr. Glenn T. Seaborg, chairman of the Atomic Energy Commission and co-discoverer of several heavy elements, received patent No. 2,990,242 for a process separating plutonium compounds from a nitric acid solution by adding ammonium nitrate and ethyl sulfide. Rights were assigned to the Atomic Energy Commission. The plutonium was created by bombarding uranium with neutrons in a nuclear reactor.

A footbath for decontaminating radioactive shoes or rubbers of persons working

with dangerous radiation was patented by Robert L. Rod, Roslyn, N.Y., who assigned rights of patent No. 2,989,965 to Acoustica Associates, Inc., Mineola, Long Island, N.Y. High-frequency sound vibrates the liquid in the bath when a person steps on an elevated platform in the tub, providing a decontaminating or cleansing action.

• Science News Letter, 80:45 July 15, 1961

TECHNOLOGY

Ceramics Proved Best For Power Generators

► CERAMICS HAVE PROVED to be the best material for checking the white-hot stream of gases in a new kind of electric power generators.

Westinghouse Electric Corporation scientists, Pittsburgh, Pa., believe ceramics will be superior to iron and steel for magneto-hydrodynamic (MHD) electric power generators.

They found that ceramics, relatives of those widely used for making bricks, tile and pottery, could be used to line the walls of the MHD generators and to project into the stream of gas that provides the electric power.

Magneto-hydrodynamic is one of the newest methods for direct generation of electricity without using a steam turbine or rotating electric generator. Future MHD generators are expected to be more efficient, smaller in size and less in cost than systems used today.

• Science News Letter, 80:45 July 15, 1961

ASTRONOMY

Moon Used to Pinpoint Space Radio Source

► A BRITISH astronomer has measured the position of a heavenly source of radio waves from space with the help of the moon, believed the most accurate such pinpointing yet made.

So far only a small number of radio sources have been seen in photographs. Most are known only from their radio waves, received here on earth.

Dr. C. Hazard of the University of Manchester radio astronomy laboratories used the 250-foot radio telescope at Jodrell

ASTRONOMY

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Bank to track the radio source, 3C 212, during a lunar eclipse.

As the moon passed in front of the radio source, a sharp drop occurred in the radio waves being received. When the moon had passed all the way across the radio source, the waves came in full power again, Dr. Hazard reports in *Nature*, 191:58, 1961.

The radio source is located between the constellations Taurus, the bull, and Virgo, the virgin, about 30 degrees south of the zenith. Its position was calculated from the times of disappearance and reappearance of the radio source.

• Science News Letter, 80:45 July 15, 1961

PUBLIC SAFETY

Blast Shelter Designed For Farm Families

► A SHELL-SHAPED "do it yourself" bomb shelter, designed to accommodate as many as nine persons for two weeks, is being built at Kansas State University, Manhattan, Kans.

Proposed for construction and use by farm families, the blast and fallout shelter will be a sort of underground igloo with concrete walls eight inches thick. Protection is believed adequate against a 20-kiloton blast if the shelter is at least 2,000 feet from the detonation point.

Builders first dig a trench 13 feet in diameter and three feet deep, placing the dirt in a rounded pile in the center. The concrete shell is laid on the dirt and allowed to set. The dirt is then removed from inside and thrown on top of the structure. A piece of culvert pipe can be used as an entrance.

The shelter provides six feet of headroom in a space about six-by-six. The demonstration model is being built by the University's departments of nuclear and civil engineering under contract from the Office of Civil and Defense Mobilization. It will be fully equipped and studied for shielding effects and environmental problems.

• Science News Letter, 80:45 July 15, 1961

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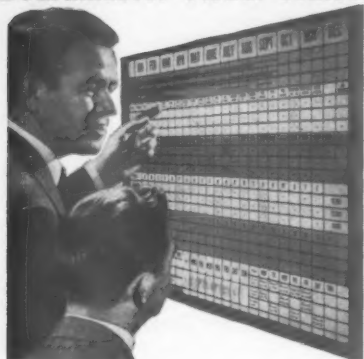
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GEOPHYSICS

Core Samples Show Sea Life 25 Million Years Ago

▶ AN OCEAN FLOOR teeming with sea life 25,000,000 years ago is indicated by the first core samples taken from the deepest well drilled into the ocean floor.

Fossil evidence from a 109-foot core of deep ocean ooze showed that sea life near Guadalupe Island off the western coast of Mexico was abundant for about 7,000,000 years and then tapered off to the present oceanic barren life.

The findings were announced by the National Academy of Sciences and the National Science Foundation, the leaders and sponsors of the deep-sea drilling program. The drilling is part of Project Mohole, eventual goal of which is to drill through the earth's crust to the underlying mantle.

The first direct heat measurements ever made 500 feet below the ocean floor also were somewhat higher than expected from earlier shallower ocean bottom measurements. Scientists believe the heat is conducted up through the earth's crust from the molten interior.

The measurements were made by the project's ship, CUSS I, anchored in 12,250-foot deep water.

• Science News Letter, 80:46 July 15, 1961

MEDICINE

Lower Radiation Doses Using Two Drugs

▶ TWO DRUGS that, in themselves, do little to fight cancer, have been found to make cancer cells more susceptible to radiation, scientists from the National Cancer Institute, Bethesda, Md., reported.

Drs. J. Robert Andrews and Roger J. Berry told the Radiation Research Society that with the help of these two drugs, known as IUDR and BUDR, lower doses of radiation are more effective, at least against certain types of mouse cancer.

To determine just how much good the drugs do, the scientists developed a new technique for measuring exactly how much cancer cells are damaged by known amounts of radiation.

In another experiment, Drs. Andrews and Berry also found that, in some respects, neutron beam irradiation is a better cancer treatment than the widely used X-rays.

Neutron irradiation given alone, they said, was just as effective as X-rays given under oxygen tension. It is well known that increasing the oxygen pressure within a target cell renders the cell more susceptible to X-rays.

• Science News Letter, 80:46 July 15, 1961

EDUCATION

Grant Program Renewed For Teacher Training

▶ THE FOURTH annual renewal of a National Science Foundation program permits some 11,000 secondary school teachers of science and mathematics to get supplemental training during out-of-school hours.

For the 1961-62 school year, NSF grants total \$2,700,000. The money will support 236 In-Service Institutes at colleges and universities where institutes are conducted.

Attending teachers in grades seven through 12 will learn more about their respective fields, encounter new textbooks and laboratory materials, and in some cases work on a part-time basis toward a master's degree.

The Foundation's other grant programs for science and mathematics teachers this year will include 398 summer institutes, expected to be attended by 20,000; 43 academic year institutes held during the college year (with possible summer extensions), with 1,500 teachers scheduled; and summer research participation programs at 104 colleges and universities for 300 secondary school teachers and 350 college science teachers.

• Science News Letter, 80:46 July 15, 1961

HORTICULTURE

Apples Grow Fastest When "Put to Bed"

▶ APPLES GROW twice as fast as usual when the trees are "put to bed" at high noon, scientists at Pennsylvania State University, University Park, Pa., have found.

In studying the influence of light and darkness on growth of the Golden Delicious apples, Dr. Loren D. Tukey, associate professor of pomology, covered young fruit-bearing trees with black cloth at noon. Except that the light inside the tent measured one to two foot candles (almost total darkness) while daylight was about 10,000 foot candles, all other conditions were about equal.

The apples grew fastest after a succession of bright days during which carbohydrates accumulated in tree tissues. Dr. Tukey also discovered that the fruits have an indestructible natural rhythm. They grow fastest during the night, shrink somewhat during forenoon and recover and resume growth as evening approaches.

When this rhythm is disrupted by the noontime "sleep" induced by the experiments, the trees followed the artificial rhythm. But when the tents were removed, the trees returned to their own rhythm.

• Science News Letter, 80:46 July 15, 1961

RADIO ASTRONOMY

Radio Telescope Will Scan Moon for Volcanic Action

▶ POSSIBLE VOLCANIC activity on the moon and the atmospheres of other planets are among a wide range of subjects to be studied by a small, versatile radio telescope at the University of California, Berkeley.

The ten-foot dish was given to the University by the Office of Naval Research. The new antenna will intercept radio signals of completely different wavelength than those received by large radio telescopes. It will tune in on four- to eight-millimeter waves (about a fifth of an inch) while the large instruments are designed for much longer waves.

• Science News Letter, 80:46 July 15, 1961

VIROLOGY

Antiviral Agent Stops Cold Virus in Test Tube

► AN ANTIVIRAL AGENT known only as 1758 has been found helpful in protecting cells against a common cold virus.

Although 1758 is derived from a penicillium mold, its action is quite different from that of penicillin, a research team from Indiana University Medical Center in Indianapolis reports in *Utica, N.Y.*

Penicillin acts chiefly by inhibiting the growth of bacteria. The 1758, however, protects the cells by making them more resistant to the attacking virus.

In experiments with Salisbury virus H.G.P., isolated from a human cold, the Indiana researchers found that monkey kidney cells grown in test tubes resisted the virus for at least 14 days, perhaps longer, when protected with 1758 in appropriate concentration. There was no damage to the cells from the virus during this time, but the virus itself was also apparently unharmed. Drs. H. M. Powell, D. N. Walcher and C. Mast report in the current *Proceedings of the Society for Experimental Biology and Medicine*, 107:55, 1961.

They said that other workers have found 1758 also protects cells against poliovirus in the test tube. Whether the agent can be used effectively in the human body is still unknown.

• Science News Letter, 80:47 July 15, 1961

GEOPHYSICS

Cosmic Ray Particles May Affect Heredity

► HIGH SPEED "visitors" from outer space—cosmic ray particles that rain down on earth continuously—may be playing a part in the evolution of life on earth, a California physicist believes.

Dr. H. V. Neher, professor at California Institute of Technology, said the few particles reaching earth may occasionally strike and alter a gene in a reproductive cell, causing new variations in plants and animals.

Dr. Neher pointed out, however, that clouds of matter from the sun form a huge protective "solar shield" that helps protect earth from these "bullets from space."

The earth has two additional shields of its own that further reduce the number of incoming particles. These are earth's magnetic field, which deflects particles away, and its atmosphere, where particles smash into atomic nuclei.

Collisions in the atmosphere between particles and nuclei release energy, which forms into bits of matter called pi mesons, which in turn quickly decay into mu mesons. Some of these mu mesons, or secondary cosmic rays, slam into the earth to penetrate a thousand feet or more.

Together with the few primary cosmic particles that get through without any collisions, they flash through you in groups of 30 to 40 every second at almost the speed of light, which is 186,000 miles a second.

They are the only known particles of matter to reach us from beyond the solar system.

Dr. Neher, who has studied these space visitors 27 years, is aided by balloons carry-

ing cosmic-ray counting devices to an altitude of more than 100,000 feet. His work is supported by the Office of Naval Research.

Most cosmic rays probably were born during the explosion of stars, and may have traveled as long as a million years through magnetic fields in the galaxy that includes the solar system. A few high-velocity particles may even have originated in distant galaxies.

• Science News Letter, 80:47 July 15, 1961

CHEMISTRY

Air Force Tests New Heat-Resistant Fiber

► AN ORGANIC FIBER that looks like nylon but is far more resistant to high temperature has been developed.

The fiber, called HT-1, could be used in tires for the B-70 Valkyrie bomber and other aircraft, decelerator parachutes for space capsules, personnel parachutes and packs, and military clothing.

HT-1 will not melt, fuse or burn as nylon does, and it will not support combustion when removed from a flame, as cotton does, the Air Force reports. The new fiber will withstand temperatures as high as 840 degrees Fahrenheit before it carbonizes, compared to a melting point of 482 degrees Fahrenheit for nylon.

The fiber was developed for the Air Force by the E. I. du Pont de Nemours & Company, Wilmington, Del. HT-1 is a wholly aromatic polyamide with remarkable toughness and resistance. Du Pont is testing it in both fiber form and a newer experimental paper form.

• Science News Letter, 80:47 July 15, 1961

SPACE

Space Chamber Built For Testing Satellites

See Front Cover

► A 55-TON satellite chamber has been designed to duplicate conditions 200 miles above the earth for testing space vehicles.

The chamber, seen on the cover of this week's *SCIENCE NEWS LETTER*, has been placed on top of a specially constructed building through which satellites will be raised for testing. The protrusions on the chamber, built for Lockheed Missiles and Space Company, Sunnyvale, Calif., are ducts that will lead to pumps creating a vacuum inside.

• Science News Letter, 80:47 July 15, 1961

Questions

ORNITHOLOGY—How are young albatrosses able to keep cool? p. 34.

SPACE—How far away is Transit IV-A satellite at the point farthest away from earth? p. 35.

Photographs: Cover, Lockheed Missiles and Space Company; p. 34, The Boeing Company; p. 35, U.S. Navy; Atomic Energy Commission; p. 39, Frederick E. Lederer; p. 42, Fremont Davis; p. 48, Eastman Chemical Products, Inc.

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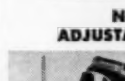
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✿ **ADAPTABLE DISHWASHER** can be installed in walls, under or above kitchen counters, and in other areas hitherto inaccessible to conventional dishwashers, without any special cabinet modifications. Available in three sizes, the plug-in, 30-inch long units use water waves instead of sprays to wash and purify dishes in 25 minutes, leaving them spotless.

• Science News Letter, 80:48 July 15, 1961

✿ **LUMINOUS ELEVATOR WALLS** of polyester-glass fiber are illuminated from the rear by fluorescent lighting. The wall panels may be plain or incorporate abstract or decorative designs, enhancing the beauty of the elevator car's interior.

• Science News Letter, 80:48 July 15, 1961

✿ **GAS-SIPHONING PUMP** easily transfers gasoline from automobile to power mower, outboard motor or can. The polyethylene pump has two check valves which give the siphoning action. To operate, the hose is inserted in the supply tank and the hand pump squeezed.

• Science News Letter, 80:48 July 15, 1961

✿ **PLANTING POTS** of cardboard, coated on both sides with a green plastic, are very durable for use in nurseries or home gardens and orchards. The colored coating



also helps retain moisture. Available in 5- to 12-inch sizes, the lightweight pots, shown in the photograph, come with or without air holes, depending on the type of plant used.

• Science News Letter, 80:48 July 15, 1961

✿ **SOAP SAVER** for the economy minded holds pieces of left-over soap too tiny to be

used otherwise. The soap pieces are inserted in a perforated plastic "soap bar" that produces suds when put in water and rotated.

• Science News Letter, 80:48 July 15, 1961

✿ **SAW-KNIFE** can be used as a keyhole saw or knife for cutting wood, metal and plastics. Three knife blades and blade guard are stored in the 6½-inch aluminum handle. Wood-cutting and metal-cutting blades are included in the unit.

• Science News Letter, 80:48 July 15, 1961

✿ **COMBINATION VIEWER-PROJECTOR** projects life-sized pictures from 16mm film without using a screen. A bell-shaped plastic tube with double focusing lens, the viewer doubles as a projector by attaching it with a rubber adapter to any standard flashlight. A color film strip, "Story of the Bible," comes with the projector.

• Science News Letter, 80:48 July 15, 1961

✿ **PORTABLE ALARM** uses a transistorized pocket-sized radio transmitter that sends a radio signal to a fixed receiver, sounding an alarm. The 10-inch- and 5-inch-long battery-operated transmitters have ranges of 120 and 100 feet respectively. The unit can also control lights and other electrical equipment.

• Science News Letter, 80:48 July 15, 1961



Nature Ramblings



Do You Know?

► **VACATION WANDERERS** on any seashore are likely to come upon them in numbers—the empty cuirasses of the horseshoe crab. Or they may even find one with the owner still inside, scuttling down the moist sand toward the water or moving along the bottom of a shallow pool like a submarine armored tank.

There is something slightly uncanny about the movements of these archaic-looking creatures, for their legs are concealed under a rim of armor and they seem to glide along without visible means of support.

The name "horseshoe crab" is more or less a misnomer. The animal is not a crab at all. Its nearest cousins long ago forsook a marine existence and took to life on the shore. It is an arachnid and its relatives are spiders and scorpions. One mark that identifies it as an arachnid and separates it from the true crabs is the absence of antennae, or feelers. Arachnids have none, but true crabs have two pairs.

Horseshoe Crab



Although the horseshoe crab has a rather formidable appearance, it really is quite harmless. It does not even have the claws of the ordinary crab and is quite shy in the presence of humans.

But the somewhat old-fashioned appearance is appropriate, because the horseshoe crab is very ancient. Some of the earliest rocks that show signs of life include remains of organisms very much like the horseshoe crabs of today.

• Science News Letter, 80:48 July 15, 1961

An alkaloid called solanine normally found in potatoes can be toxic when present in large enough amounts, and is now thought to cause potato poisoning.

Well fertilized pasture grasses may be as high as 28% to 30% in protein in April and then decline to 4% to 7% in July and August.

The first U. S. astronaut broadcast from outer space to earth was powered by two small electron tubes about the thickness of a pencil.

Anti-cancer drugs are most effective at the time of cell division.

The decimal inch scale, which achieved national status for the first time in 1957, was used as far back as 1792 by Benjamin Franklin when he designed his famous Franklin stove.

• Science News Letter, 80:48 July 15, 1961

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